1. (amended) An ultrasonic catheter comprising:

a body having a longitudinal axis, a circumference and a distal end region;

a first ultrasonic transducer array disposed in the distal end region of the body and having a first field of view; and

a second ultrasonic transducer array disposed in the distal end region of the body and having a second, different field of view;

wherein the body comprises a body adapted for insertion into a blood stream.

2. (original) An ultrasonic catheter according to claim 1 wherein the first ultrasonic array is a linear phased array and the second ultrasonic array is a radial phased array.

3. (original) An ultrasonic catheter according to claim 2 wherein the linear phased array has an azimuth that is parallel to the longitudinal axis of the body.

4. (original) An ultrasonic catheter according to claim 2 wherein the linear phased array is disposed proximal of the radial phased array.

5. (original) An ultrasonic catheter according to claim 2 further comprising a third ultrasonic array wherein the third ultrasonic array is a second radial phased array which is separated from the radial phased array along the longitudinal axis of the body.

6. (original) An ultrasonic catheter according to claim 5 wherein the linear phased array is disposed between the radial phased array and the second radial phased array.

7. (amended) An ultrasonic system comprising:

an intravascular ultrasonic catheter comprising a body having a longitudinal axis, a circumference and a distal end region, a first ultrasonic transducer array disposed in the distal end region of the body and having a first field of view, and a second ultrasonic transducer array disposed in the distal end region of the body and having a second, different field of view; and

a transmit beamformer and a receive beamformer coupled to each of the first and second ultrasonic transducer arrays.

8. (original) An ultrasonic system according to claim 7 wherein the first array is a linear phased array and the second array is a radial phased array.

9. (original) An ultrasonic catheter according to claim 2 wherein the linear phased array has a plurality of transducer elements sequentially disposed along the longitudinal axis of the body.

10. (original) An ultrasonic catheter according to claim 2 wherein the linear phased array is curved around a distal most point of the distal end region of the body.

11. (original) An ultrasonic system according to claim 7 further comprising a display system coupled to the transmit and receive beamformers to display the acquired image frames from the first and second arrays.

12. (original) An ultrasonic system according to claim 7 further comprising a computer coupled to the transmit and receive beamformers wherein the computer is programmed to (1) acquire a plurality of sets of two-dimensional image data in an image plane generated by the first array upon excitation by the transmit beamformer, the first array moved between acquisition of at least some of the sets of image data (2) acquire two-dimensional tracking data in one tracking plane oriented at a non-zero angle with respect to the image plane with the second array upon excitation by the transmit beamformer, the second array moved between acquisition of at least some of the sets of tracking data; (3) automatically determine a component of motion based on a comparison of at least a portion of the tracking sets acquired in step (2), and (4) automatically use the component of motion determined in step (3) to register select ones of the image data acquired in step (1).

13. (original) An ultrasonic system according to claim 12 wherein the first array is a linear

phased array and the second array is a radial phased array.

14. (original) An ultrasonic system according to claim 12 wherein the first array is a radial phased array and the second array is a linear phased array.

15. (original) A method for registering image information acquired from an interior region of a patient, said method comprising the steps of:

(a) inserting a catheter into a patient to image an interior region of the patient, the catheter having a body having a longitudinal axis, a circumference and a distal end region, a first ultrasonic transducer array disposed in the distal region of the body and a second phased ultrasonic transducer array disposed in the distal end region of the body;

(b) acquiring a plurality of sets of image data in an image plane with the first ultrasonic transducer array, the first ultrasonic transducer array moved between acquisition of at least some of the sets of image data;

(c) acquiring a plurality of sets of tracking data in a tracking plane oriented at a non-zero angle with respect to the image plane with the second ultrasonic transducer array, the second ultrasonic transducer array moved between acquisition of at least some of the sets of tracking data;

(d) automatically determining a component of motion based on a comparison of at least a portion of the tracking sets acquired in step (c); and

(e) automatically using the component of motion determined in step (d) to register select ones of the image data sets acquired in step (b).

16. (original) The method of claim 15 wherein the step (d) comprises the step of correlating the tracking data sets acquired in step (c).

17. (original) The method of claim 15 wherein the first image information comprises information selected from the group consisting of B mode information, color Doppler velocity information, color Doppler energy information, and combinations thereof.

18. (original) The method according to claim 15 wherein the step of moving the first and second ultrasonic transducer arrays comprises rotating the catheter.

19. (original) The method according to claim 15 wherein the step of moving the first and second ultrasonic transducer arrays comprises translating the catheter in a direction parallel to the longitudinal axis.

20. (amended) A method for imaging a cardiac structure, the method comprising the steps of:

(a) inserting a catheter having a body having a longitudinal axis, a circumference and a distal end region with a first phased ultrasonic transducer array and a second phased ultrasonic transducer array disposed thereon, the inserting being into a cardiac structure;

(b) acquiring image information from the first phased ultrasonic transducer array with a first field of view; and

(c) acquiring image information from the second phased ultrasonic transducer array with a second field of view.

21. (original) A method according to claim 20 further comprising the step of displaying the image information acquired in steps (b) and (c) on a display unit.

22. (original) A method according to claim 21 wherein the image information acquired in steps (b) and (c) are simultaneously displayed.

23. (original) A method according to claim 21 wherein the image information acquired in steps (b) and (c) are sequentially displayed.

24. (original) A method for registering image information acquired from an interior region of a patient, said method comprising the steps of:

(a) inserting an catheter having a body having a longitudinal axis, a circumference and a distal end region, a linear phased ultrasonic transducer array disposed in the distal region of the body and a first radial phased ultrasonic transducer array disposed around the circumference of

the distal end region of the body into a patient to image an interior region of the patient;

(b) acquiring first two-dimensional image information in an image plane with the radial phased ultrasonic transducer array;

(c) acquiring tracking two-dimensional data information in a tracking plane oriented at a non-zero angle with respect to the image plane with the linear phased ultrasonic transducer array;

(d) repeating steps (b) and (c) after moving the catheter along a direction having a component of motion in the tracking plane;

(e) automatically determining the component of motion based on a comparison of the tracking two-dimensional data information acquired in steps (c) and (d); and

(f) automatically using the component of motion determined in step (e) to register the first image information acquired in step (d) with the first image information acquired in step (b).

25. (original) The method of claim 24 wherein step (e) comprises the step of correlating the tracking two-dimensional information acquired in steps (c) and (d).

26. (original) The method of claim 24 wherein the first image information comprises information selected from the group consisting of B mode information, color Doppler velocity information, color Doppler energy information, and combinations thereof.

27. (original) An ultrasonic catheter according to claim 2 wherein the radial array is an annular array.

28. (original) An ultrasonic catheter according to claim 2 wherein the radial array is a curved linear phased array.

29. (original) An ultrasonic catheter according to claim 2 wherein the radial array is a planar linear phased array.

30. (original) An ultrasonic catheter according to claim 5 wherein the radial phased array and second radial phased array are annular arrays.

31. (original) An ultrasonic catheter according to claim 5 wherein the radial phased array is an annular array and the second radial phased array is a curved linear phased array.

32. (original) An ultrasonic catheter according to claim 5 wherein the linear phased array is a curved array.

33. (original) An ultrasonic catheter according to claim 6 wherein the radial phased array and the second radial phased array are annular arrays.

34. (original) An ultrasonic catheter according to claim 6 wherein the radial phased array is an annular array and the second radial phased array is a curved linear phased array.

35. (original) An ultrasonic catheter according to claim 2 wherein the linear phased array is disposed distal of the radial phased array.

36. (original) An ultrasonic catheter according to claim 35 wherein the radial phased array is an annular array.

37. (original) An ultrasonic catheter according to claim 36 wherein the linear phased array is a curved array.

38. (original) An ultrasonic catheter according to claim 35 further comprising a second radial phased array disposed in the distal end region of the body.

39. (original) An ultrasonic catheter according to claim 38 wherein the second radial phased array is disposed proximal of the radial phased array.

40. (original) An ultrasonic catheter according to claim 39 wherein the radial phased array and second radial phased array are annular arrays.

41. (original) An ultrasonic system according to claim 12 further comprising a display system

coupled to the transmit and receive beamformers to display the two-dimensional image information and the component of motion determined in step (3).

42. (original) An ultrasonic catheter according to claim 12 further comprising the steps of repeating steps (1), (2) and (3) and accumulating the component of motion determined in step (3) to generate a composite detected motion wherein the composite detected motion indicates the motion of the catheter with respect to a predetermined reference point.

43. (original) An ultrasonic system according to claim 41 wherein the first array is a linear phased array and the second array is a radial phased array.

44. (original) An ultrasonic system according to claim 43 wherein the composite detected motion is illustrated as a circular icon with an arrow indicating the degree of rotation from a reference point.

45. (original) An ultrasonic system according to claim 44 further comprising a numerical display of the composite detected motion.

46. (original) An ultrasonic system according to claim 44 wherein the computer is further programmed to acquire two-dimensional image information in an image plane generated by the second array upon excitation by the transmit beamformer and the display system displays the two-dimensional image information generated by the second array.

47. (original) An ultrasonic system according to claim 46 wherein the circular icon is displayed over the two-dimensional image information generated by the second array.

48. (original) An ultrasonic system according to claim 47 wherein the position of the two-dimensional image information changes according to the composite detected motion.

49. (original) An ultrasonic system according to claim 41 wherein the first array is a radial phased array and the second array is a linear phased array.

50. (original) An ultrasonic system according to claim 49 wherein the composite detected motion is illustrated as a ruler icon with an arrow indicating the degree of translation from a reference point.

51. (original) An ultrasonic system according to claim 50 further comprising a numerical display of the composite detected motion.

52. (original) An ultrasonic system according to claim 50 wherein the computer is further programmed to acquire two-dimensional image information in an image plane generated by the second array upon excitation by the transmit beamformer and the display system displays the two-dimensional image information generated by the second array.

53. (original) An ultrasonic system according to claim 52 wherein the ruler icon is displayed over the two-dimensional image information generated by the second array.

54. (original) An ultrasonic system according to claim 53 wherein the position of the two-dimensional image information compensates for the composite detected motion.

55. (original) The method of claim 15 further comprising the steps of:

(f) repeating steps (b), (c), and (d) and accumulating the component of motion detected in step (d) to generate composite detected motion wherein the composite detected motion indicates the motion of the catheter with respect to a predetermined reference point;

(g) displaying the two-dimensional image data acquired in step (b); and

(h) displaying the composite detected motion determined in step.

56. (original) The method according to claim 55 wherein the step of displaying the composite detected of motion comprises displaying an icon representation of the composite detected motion.

57. (original) The method according to claim 56 wherein the second array is a radial phased

array and the icon is a circle with an arrow indicating the degree of rotation.

58. (original) The method according to claim 56 wherein the second array is a linear phased array and the icon is a ruler with an arrow indicating the degree of translation.

59. (original) The method according to claim 55 further comprising the step of (i) acquiring two-dimensional image information in the tracking plane with the second array; and (j) displaying the two-dimensional image information acquired in step (i).

60. (original) The method according to claim 59 wherein the step of displaying the composite detected motion comprises displaying an icon representative of the composite detected motion.

61. (original) The method to claim 60 wherein the icon is displayed over the two-dimensional image information displayed in step (j).

62. (original) The method according to claim 55 wherein the step of displaying the composite detected motion comprises displaying a numerical value representative of the composite detected motion.

63. (original) A method according to claim 20 wherein the first array is a linear phased array and the second array is a radial phased array.

64. (original) A method according to claim 63 wherein the radial phased array is an annular array.

65. (original) An ultrasonic system according to claim 12 further comprising a display system coupled to the transmit and receive beamformers to display a three-dimensional image.

66. (original) The method of claim 15 further comprising the step of displaying a three-dimensional image.

67. (original) An ultrasonic catheter according to claim 1 further comprising a position/orientation sensor disposed in the distal end region of the body.

68. (original) An ultrasonic catheter according to claim 67 wherein the sensor is a magnetic sensor.

69. (original) An ultrasonic catheter according to claim 1 wherein the first and second ultrasonic transducer arrays are each coupled to a transmit beamformer and a receive beamformer, and a processor is coupled to the transmit and receive beamformers wherein the processor is programmed to (1) acquire two-dimensional image information in an image plane generated by the first array upon excitation by the transmit beamformer, (2) acquire tracking two-dimensional data information in one tracking plane oriented at a non-zero angle with respect to the image plane with the second array upon excitation by the transmit beamformer; (3) repeat steps (1) and (2) after the catheter has been moved along a direction having a component of motion in the tracking plane (4) determine the component of motion based on a comparison of the tracking two-dimensional data information acquired in steps (2) and (3), and (5) use the component of motion determined in step (4) to register the first image information acquired in step (3) with the image information acquired in step (1).

70. (original) An ultrasonic catheter according to claim 69 wherein the first array is a linear phased array and the second array is a radial phased array.

71. (original) An ultrasonic catheter according to claim 69 wherein the first array is a radial phased array and the second array is a linear phased array.

72. (original) An ultrasonic catheter according to claim 69 wherein the processor is coupled to a display wherein the two-dimensional image information acquired in step (1) and the component of motion determined in step (4) can be displayed.

73. (original) An ultrasonic catheter according to claim 69 wherein the processor is programmed to acquire two-dimensional image information with the second array and wherein